# (19) World Intellectual Property Organization International Bureau





## (43) International Publication Date 14 February 2002 (14.02.2002)

### **PCT**

# (10) International Publication Number WO 02/013343 A3

(51) International Patent Classification<sup>7</sup>: H01S 5/12, 5/40, 5/026

(21) International Application Number: PCT/US01/24969

(22) International Filing Date: 9 August 2001 (09.08.2001)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/224,384 60/244,696 9 August 2000 (09.08.2000) US 30 October 2000 (30.10.2000) US

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(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

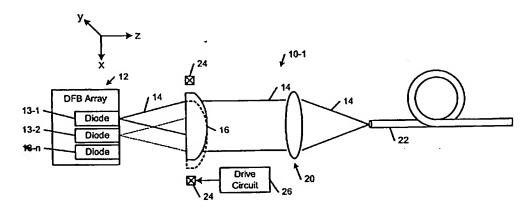
#### Published:

— with international search report

(88) Date of publication of the international search report: 31 July 2003

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: TUNABLE DISTRIBUTED FEEDBACK LASER



(57) Abstract: A wavelength tunable laser includes a distributed feedback (DFB) array with first and second DFB laser diodes that generates first and second beams of light in first and second wavelength ranges. A microelectromechanical (MEMS) optical element selectively couples one of the first and second beams of light from the DFB laser array into an optical waveguide. The MEMS optical element includes a collimating lens and a thermal or electrostatic MEMS actuator for moving the collimating lens to select the one of the first and second beams of light. A focusing lens is located between the collimating lens and the optical waveguide. Alternately, the MEMS opticall element includes a fixed collimating lens that collimates the first and second beams of light, a mirror, and a MEMS actuator for tilting the mirror to select the one of the first and second beams of light.

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#### INTERNATIONAL SEARCH REPORT

Interr ,pplication No PCT/US 01/24969

CLASSIFICATION OF SUBJECT MATTER PC 7 H01S5/12 H01S A. CLASS H01S5/40 H01S5/026 According to International Patent Classification (IPC) or to both national classification and IPC **B. FIELDS SEARCHED** Minimum documentation searched (classification system followed by classification symbols) H01S G02B IPC 7 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, PAJ, INSPEC C. DOCUMENTS CONSIDERED TO BE RELEVANT Relevant to claim No. Category \* Citation of document, with indication, where appropriate, of the relevant passages US 5 784 183 A (TANIWATARI TSUYOSHI ET 1,27,52, Α 67,81, AL) 21 July 1998 (1998-07-21) 88,95, 98,101, 102 column 8, line 7-20; figures 7,9 column 9, line 12-41; claim 1 1,27,52, PATENT ABSTRACTS OF JAPAN A 67,95, vol. 2000, no. 02, 29 February 2000 (2000-02-29) & JP 11 326707 A (MATSUSHITA ELECTRIC IND 101 CO LTD), 26 November 1999 (1999-11-26) abstract Further documents are tisted in the continuation of box C. Patent family members are listed in annex. Special categories of cited documents: "T" later document published after the International filing date or priority date and not in conflict with the application but clied to understand the principle or theory underlying the "A" document defining the general state of the art which is not considered to be of particular relevance Invention "E" earlier document but published on or after the international "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to the thrown an inventive step when the document is taken alone filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such docu-ments, such combination being obvious to a person skilled \*O\* document referring to an oral disclosure, use, exhibition or other means in the art. document published prior to the international filing date but later than the priority date claimed "&" document member of the same patent family Date of the actual completion of the international search Date of mailing of the International search report 28/01/2003 21 January 2003 Name and mailing address of the ISA Authorized officer European Palent Office, P.B. 5818 Patentiaan 2 NL - 2280 HV Rijswijk Tel (+31-70) 340-2040, Tx. 31 651 epo ni, Claessen, L Fax: (+31-70) 340-3016

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